16-bit Advanced Wave Table Audio Card

Plug and Play

GETTING STARTED

Getting Started

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October 1995

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- ☐ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ☐ Consult the dealer or an experienced radio/TV technician for help.

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ATTENTION: Cette carte est destinée à être installée par l'utilisateur, dans un ordinateur compatible certifié CSA/TUV/UL ou listé IBM AT, à l'intérieur de la zone définie par le fabricant. Consulter le mode d'emploi ou le fabricant de l'appareil pour vérifier ou confirmer si l'utilisateur peut y installer lui-même des cartes périphériques.

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- ☐ Directive 89/336/EEC, 92/31/EEC (EMC)

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Introduction

Welcome to the world of advanced wavetable synthesis!

Your 16-bit audio card allows you to achieve realistic acoustic reproduction through a wide range of digitized sound samples. It also has a built-in Creative 3D Stereo Enhancement technology which enriches the depth and breadth of the sounds produced.

Fully Adlib and Sound Blaster compatible, your audio card supports the following features:

- ☐ Plug and Play ISA Specification version 1.0a compliance,
- ☐ Major MIDI standards such as General MIDI, Roland GS and MT-32.
- ☐ Compression algorithms such as A-law, Mu-law, CTADPCM, and IMA-ADPCM.

Relax and enjoy as we show you how to install and make the most of your audio card through this simple Getting Started manual.

Before You Begin

Before starting on your audio exploration, you need to do a few pretty mundane but very important things. Please read the following sections thoroughly:

- ☐ Checking System Requirements
- ☐ Getting Latest Information
- ☐ Making a Copy of Your Diskettes
- ☐ Using This Guide
- ☐ Document Conventions

Checking System Requirements

The minimum system requirements for your audio card are:

- ☐ An 80386 computer or higher, with an EGA or VGA card installed (VGA recommended).
- ☐ 7.5 MB of hard disk space for your audio card's software.
- ☐ 4 MB RAM.
- ☐ Windows 95 or
  Windows 3.1x and a Plug and Play Configuration Manager.

Getting Latest Information

Your package may come with a CD-ROM or diskettes to install your audio software. The README file, situated on the CD-ROM or first diskette, contains the latest information and changes not available at the time of printing. Please read the file before you continue.

If you are about to follow the steps for reading the README file on the audio software installation CD-ROM, we assume that you already have a CD-ROM drive installed.

To view the file in Windows 95 using the audio software's first installation diskette:

1. Start Windows 95.
2. Insert the diskette into your floppy drive.
3. Open the My Computer group box.
4. Double-click the drive icon for the drive containing your diskette.
   The README file appears in the folder.
5. Double-click the README file.
   The Windows 95 Notepad appears, displaying the text of the README file.

To view the file in Windows 95 using the audio software's installation CD-ROM:

1. Start Windows 95.
2. Insert the CD-ROM into your CD-ROM drive.
   If Windows 95 automatically starts playing the CD-ROM, a dialog box prompting you to install the software or exit the setup will appear.
3. Choose Exit.
4. Open the My Computer group box.
5. Right-click on the CD-ROM drive icon.
   A menu appears listing the various options available to the drive.
6. Select README.
   The Windows 95 Notepad appears, displaying the text of the README file.

To view the file in DOS/Windows 3.1x:

1. Start your computer.
2. If your package comes with installation diskettes, insert the first installation diskette into your floppy drive. However, if the package comes with an installation CD-ROM, insert the CD-ROM into your CD-ROM drive.
3. Change to the drive containing the file. Normally, this is drive A or B for an installation diskette and drive D for a CD-ROM.
4. Type **README** and press <Enter>.
   The Windows 3.1x Notepad appears, displaying the contents of the Readme file.

If you want to read the file in Windows 3.1x, you can do so by going to the Windows DOS box and following steps 3 and 4.

Making a Copy of Your Diskettes

If you have not made a copy of the original diskettes that come with your package, you should do so before installing the software in your system. Store your original diskettes in a safe place.

Using This Guide

This guide provides information on how to install your audio card. It is arranged as follows:

Chapter 1, "Knowing Your Audio Card"
Contains information about the various hardware components on your audio card. For the software-configurable settings, their possible settings are also listed in this chapter. If you are new to audio cards, we recommend that you read this chapter before you set up your card.

Chapter 2, "Setting Up Your Audio Card"
Guides you through the process of installing the card and associated software in your system. If you wish to install a CD-ROM drive, this chapter also gives you a brief overview on how to connect the CD-ROM drive to your audio card.

Chapter 3, "Installing Software in Windows 95"
If you are using Windows 95, this chapter helps you install the software for the operating system.

Chapter 4, "Installing Software in DOS/Windows 3.1x"
If you are using Windows 3.1x, this chapter shows you how to install the software in this operating system.

Chapter 5, "Changing Your Audio Card Settings"
Shows you how to change the hardware settings on your audio card.

Appendix A, "General Specifications"
Describes the general specifications of your audio card.

Appendix B, "Hardware Information"
Provides information on the connectors used to redirect sound from your PC speaker to the speakers connected to your audio card. Moreover, information on the SPDIF Connector (which transfers digital audio signals from recorder to recorder) is also provided.

Appendix C, "MIDI Specifications"
Lists the MIDI specifications of your audio card.

Appendix D, "Troubleshooting"
Provides tips and strategies for some of the problems you might encounter with your audio card either during installation or normal use.

Document Conventions

This manual follows certain conventions to help you locate and identify the information that you need. These conventions are described in the following sections:

☐ Text Conventions

☐ Icons

Please note that in this manual, Sound Directory or path refers to the directory where your audio card's software is stored (e.g., SB16).

Text Conventions

The following text conventions are used to help you distinguish elements of the text in this manual (see Table i).

Table i: Text Conventions.

Text Element	Use
bold	Command names, switches, and any text that must be entered exactly as it appears.
italic	Title of a book. When presented at the DOS command line, it is a placeholder that represents information you must provide. This information usually appears in the parameter listing after the command is presented.
UPPERCASE	Directory name, file name, or acronym.
<>	Symbols, letters, and key names on the keyboard.

Icons

In this manual, icons are used to highlight areas of text that require your attention (see Table ii).

Table ii: Icons.

Icon	Use
📝	Information or instructions that must not be taken lightly and should be noted.
⚠	Cautions or warnings that you must pay attention to. Information highlighted by this icon tells you how to avoid situations such as the risk of not enough memory or even damages to your system.

1

Knowing Your Audio Card

This chapter helps you locate and identify the components of your audio card. The components of the audio card comprises the following categories:

- Jacks
- Connectors
- Jumpers

Place the audio card in front of you as you go through this chapter. This will help you identify the various components described.

Jacks

Jacks are one-hole connecting interfaces on your audio card. They allow you to attach other devices to your card. Jacks are found exclusively on the rear panel of your audio card as shown in Figure 1-1.

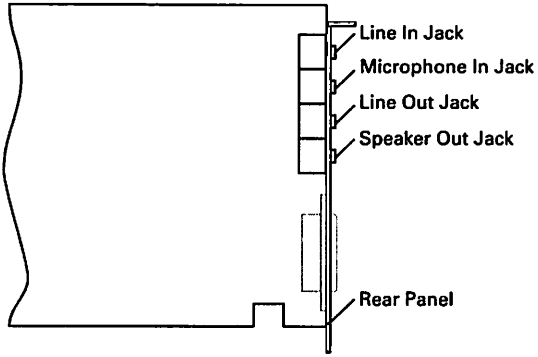


Figure 1-1: The jacks on your audio card.

Line In Jack

The Line In jack allows you to connect devices such as a cassette, DAT, or Minidisc player to your audio card for playback or recording.

Microphone In Jack

The Microphone In jack allows you to connect a microphone for voice input.

Line Out Jack

The Line Out jack allows you to bypass your card's internal amplifier to connect powered speakers or an external amplifier for audio output.

Speaker Out Jack

The Speaker Out jack allows you to connect speakers for audio output from the card's built-in power amplifier. The built-in amplifier has a maximum output power of four watts per channel from four-ohm speakers and two watts per channel from eight-ohm speakers. Do not play at maximum volume if your speakers cannot handle this power.

Your audio card has no Speaker Out jack if it does not have a built-in amplifier.

Connectors

Connectors are also interfaces on your audio card that allow you to attach other devices to your card. But, unlike jacks, connectors consist of many pairs of pins as shown in Figure 1-2.

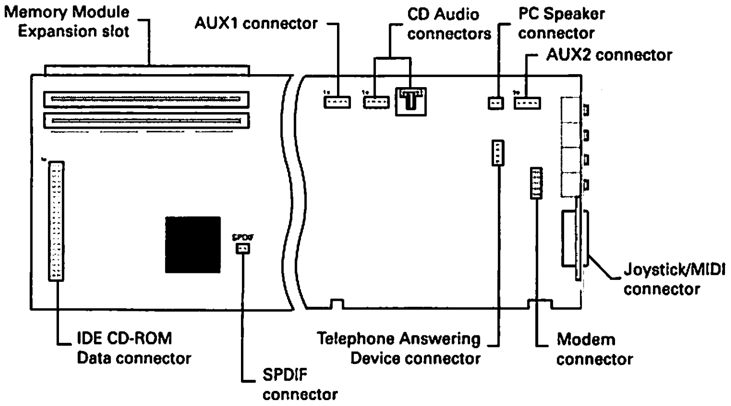


Figure 1-2: The connectors on your audio card.

The connectors found on your audio card include the following:

- ☐ AUX1 and AUX2 Connectors
- ☐ CD Audio Connector
- ☐ IDE CD-ROM Data Connector

- Joystick/MIDI Connector
- Memory Module Expansion Slot
- Modem Connector
- PC Speaker Connector
- SPDIF Connector
- Telephone Answering Device Connector

Your audio card may or may not have all the connectors listed here. If you cannot find a certain connector, please ignore all documentation on this connector in this guide.

AUX1 and AUX2 Connectors

The AUX1 and AUX2 connectors allow you to connect additional internal audio sources such as TV Tuner, MPEG, or other similar cards to your audio card. The volumes of your AUX1 and AUX2 devices are controlled by the CD and Line In volume sliders respectively in the Mixer.

Please refer to the User's Guide of your audio card for further details on the Mixer.

CD Audio Connector

The CD Audio connector allows you to connect the CD Audio cable from your audio card to a CD-ROM drive. With speakers connected to your audio card, you can listen to audio from the CD-ROM drive.

For more information, please refer to the documentation that comes with your CD-ROM drive.

Joystick/MIDI Connector

The Joystick/MIDI connector allows you to connect a joystick or MIDI kit to your audio card.

The optional MIDI kit contains a MIDI adapter with a joystick connector so that you can plug in a joystick and a MIDI device simultaneously. The kit also comes with a sequencing software that allows you to record, play and edit MIDI files.

IDE CD-ROM Data Connector

The IDE CD-ROM Data connector allows your audio card to be connected to an IDE CD-ROM drive.

Please refer to the CD-ROM drive's documentation for detailed instructions on how to connect and install the CD-ROM drive.

Memory Module Expansion Slot

The Memory Module Expansion slot allows you to install SIMMs on your audio card so that you can have more RAM for your MIDI instrument samples. You can add up to a maximum of 28 MB RAM with the SIMMs (see "Changing Your Audio Card Settings" in page 5-1).

We recommend that you use a pair of SIMMs with the same capacity. The SIMM RAM access time must be 80 nanoseconds or less.

Modem Connector

The Modem connector allows you to connect your audio card to any voice modem that is specially designed for this interface. You can also connect a Creative Modem Blaster series card to your audio card to perform voice recognition and modem functions concurrently. In addition, you can upgrade to full telephony functionality later.

If you are using this connector, please refer to Modem Blaster's documentation for further instructions.

PC Speaker Connector

The PC Speaker connector makes it possible to redirect sounds that normally come from the PC speakers to your external speakers. Please refer to Appendix B, "Hardware Information" for further details.

SPDIF Connector

The SPDIF (Sony/Philips Digital Interface Format) connector allows you to transfer digital audio signals from one recorder to another. In this way, the fidelity of a transferred digital signal is preserved. You can transfer digital signals from your audio card to a recorder only through the SPDIF connector.

Please refer to the "Hardware Information" appendix for the SPDIF Connector's pin definitions.

Telephone Answering Device Connector

The Telephone Answering Device connector provides a mono connection from a standard voice modem to your audio card. It also transmits microphone signals from your card to the modem.

Jumpers

Jumpers are groups of pins that you can configure to define the hardware settings of your audio card (see Figure 1-3).

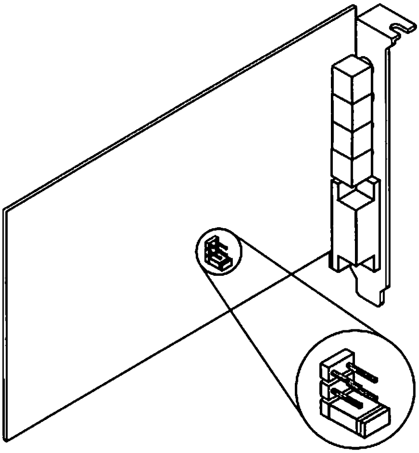


Figure 1-3: Jumpers.

A jumper exists in two states: enabled or disabled. A jumper is enabled when a plastic hood, called jumper block, is placed over the jumper's two pins as shown in Figure 1-4.

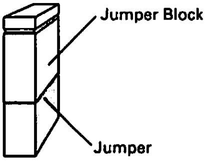


Figure 1-4: An enabled jumper.

In contrast, a disabled jumper is one with no jumper block over it or one with a jumper block over one pin as shown in Figure 1-5.

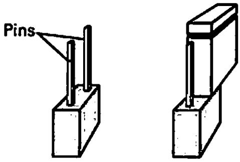


Figure 1-5: Two types of disabled jumper.

The rest of this chapter provides you with more information on the default hardware settings and preferred software configurable settings. If you wish to change these settings, see Chapter 5, "Changing Your Audio Card Settings".

Knowing the Hardware Settings

The jumpers on your audio card are shown in Figure 1-6.

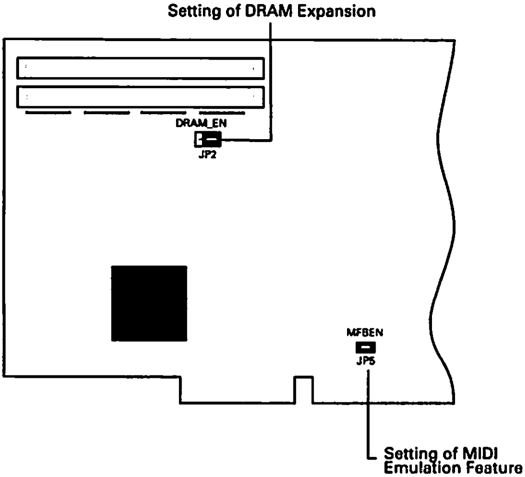


Figure 1-6: The jumpers on your audio card.

The DRAM_EN and MFBEN jumpers allow you to define the following hardware attributes respectively:

- ☐ DRAM Expansion
- ☐ MIDI Emulation

DRAM Expansion

If your audio card has no DRAM_EN jumper, please ignore all documentation in this guide that refers to this jumper.

Your audio card can support additional RAM for the expansion of the MIDI instrument maps (apart from the 512KB already on board). Single Inline Memory Modules (SIMMs) can be used to provide more RAM. The presence of the SIMMs is set by jumper DRAM_EN. The factory default setting of jumper DRAM_EN, shown in Figure 1-7, is 'No SIMMs'. Please refer to Chapter 5, "Changing Your Audio Card Settings" for more information on how to set the SIMMs.

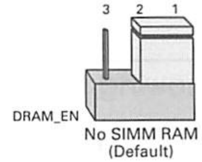


Figure 1-7

MIDI Emulation

The MFBEN jumper allows you to enable or disable the MIDI Emulation feature. This feature allows most real mode games, which do not support wave table synthesis, to play wave table music from the audio card. The MIDI output from the games is directed to the wave table music synthesizer rather than the MPU-401 interface. Games that have not been designed to use the wave table synthesis features on your card can now use them.

Note that you also need to install the DOS AWEUTIL utility for MIDI Emulation to function properly. For more information, refer to the "Advanced WavEffects Utility" chapter in your audio card's DOS/Windows 3.1x *User's Guide* (printed or online). If the *User's Guide* does not come with your package, you can refer to the AWEUTIL.TXT file found in your audio card's directory.

Protected mode software does not support MIDI Emulation. You can still play music from this type of software using the 4-operator synthesizer chip.

The factory default setting for MIDI Emulation is enabled as shown in Figure 1-8. To change this setting, see Chapter 5, "Changing Your Audio Card Settings".

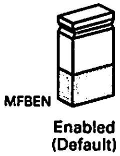


Figure 1-8

Knowing the Software-Configurable Settings

This section describes the following software-configurable settings that are set by your Plug and Play system:

- ☐ I/O Addresses
  - Base I/O Address of Audio Interface
  - Base I/O Address of Game Port
  - Base I/O Address of IDE CD-ROM Interface
  - Base I/O Address of MPU-401 UART MIDI Interface
  - Base I/O Address of Stereo Music Synthesizer
  - Base I/O Address of Advanced WavEffects Synthesizer
  - Base I/O Address of 3D Stereo Enhancement Device
- ☐ IRQ Lines
  - IRQ Line of Audio Interface
  - IRQ Line of IDE CD-ROM Interface
- ☐ DMA Channels used by Audio Interface

Your audio card supports Plug and Play. This feature allows a Plug and Play system to assign resources such as I/O addresses and interrupts to the above software configurable settings required by your newly added audio card.

I/O Addresses

I/O addresses (or I/O address range) are areas of memory used by your computer's microprocessor to distinguish among various peripheral devices connected to your system when sending or receiving data. There are several such devices on your audio card. These devices are listed in Table 1-1 with an example of Plug and Play assigned I/O address ranges.

The base I/O address is the starting address of each I/O address range.

Table 1-1: Possible I/O addresses occupied by the audio card.

I/O Address Range	Usage
200H to 207H	Game Port
220H to 22FH	Audio Interface
330H to 331H	MPU-401 UART MIDI Interface
388H to 38BH	Stereo Music Synthesizer
620H to 623H	Advanced WavEffects Synthesizer
A20H to A23H	Advanced WavEffects Synthesizer
E20H to E23H	Advanced WavEffects Synthesizer
168H to 16FH	IDE Port (Quarternary)
100H	3D Stereo Enhancement Device

IRQ Lines

The IRQ (interrupt) line is the signal line your device uses to notify your computer's central processor that it wants to send or receive data for processing.

Table 1-2 lists an example of IRQ lines that may be assigned to the two devices on your audio card that use IRQ lines.

Table 1-2: Possible IRQ line assignment.

IRQ Line	Usage
5	Audio Interface
11	IDE CD-ROM Interface

DMA Channels

The DMA (Direct Memory Access) channel is the signal line your device uses to transfer data directly to the system's memory.

The Audio interface allows you to transfer data through the Low and High DMA channels. Table 1-3 shows a possible combination of DMA channels that may be assigned to the Audio interface which requires DMA channels.

Table 1-3: Possible DMA channel assignment.

DMA Channel	Usage
1	Audio interface's Low DMA channel
5	Audio interface's High DMA channel

2

Setting Up Your Audio Card

This chapter guides you through the process of installing your audio card. It is organized as follows:

- ☐ Installing the Card
- ☐ Connecting Other Devices

If you are installing your audio card in a system that is running Windows 3.1x, you need to install a Plug and Play Configuration Manager before you proceed with the installation. The Plug and Play Configuration Manager allows you to install your Plug and Play audio card in a non Plug and Play system.

Installing the Card

Installing the audio card in your system is simple, so please follow the instructions carefully.

To install the card:

1. Switch off your system and all peripheral devices. Unplug the power cord from the wall outlet.

The power cord and wall outlet shown may be different in your country.

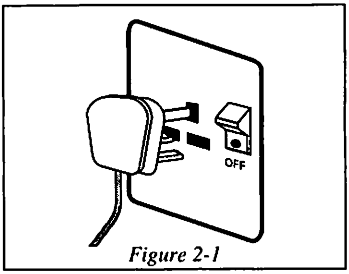


Figure 2-1

2. Touch a metal plate on your system to ground yourself and discharge any static electricity.

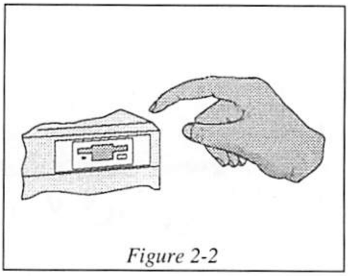


Figure 2-2

3. Remove the cover from your system.

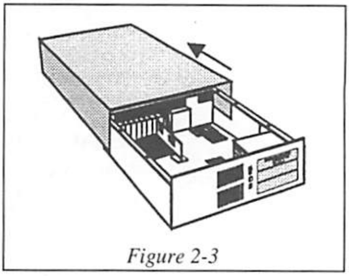


Figure 2-3

4. Find a free 16-bit expansion slot in your system.

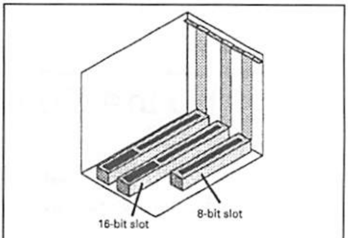


Figure 2-4

5. Remove the metal plate from the slot you have chosen and put the screw aside.

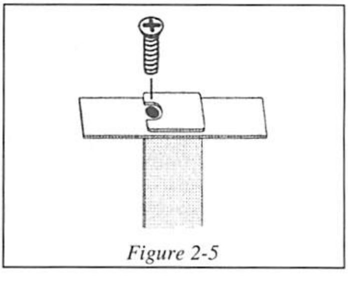


Figure 2-5

6. Align your card's 16-bit slot connector with the expansion slot and gently lower the card into the free slot as shown.

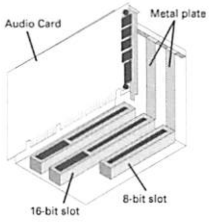


Figure 2-6

7. Secure the card to the expansion slot with the screw you removed from the metal plate.

If your package comes with a CD-ROM drive, you need to install the drive now. For more information, refer to the documentation provided with your CD-ROM drive.

8. Replace the cover of your system.

Connecting Other Devices

Once the audio card has been installed in your system, connect the speakers to your audio card's Speaker Out Jack. Figure 2-7 shows you how to connect various devices to your audio card such as a microphone and a joystick. If you want to bypass the internal amplifier, connect powered speakers or an external amplifier to the Line Out Jack.

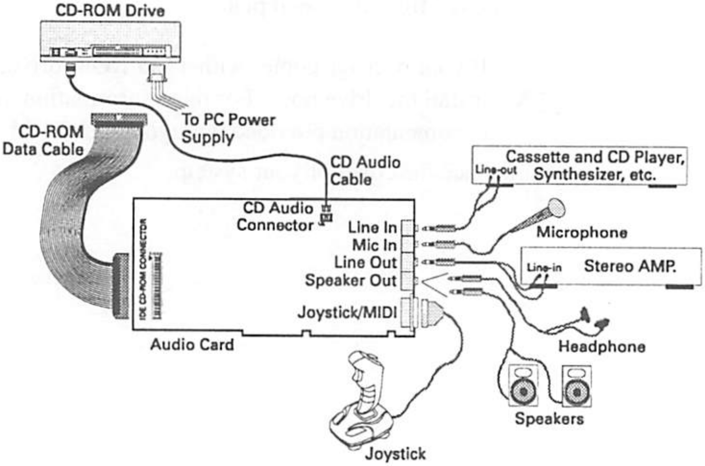


Figure 2-7: Connecting External Speakers and Other Devices.

The joystick connector on your audio card is identical to that on a standard PC game control adapter or game I/O connector. You can connect any analog joystick with a 15-pin D-sub connector. It also works well with any application that is compatible with the standard PC joystick. To use two joysticks, you need a Y-cable splitter.

3

Installing Software in Windows 95

After you have installed your audio card hardware, you can begin to install the software. This chapter guides you through the process of installing the audio card's software in Windows 95 and comprises the following sections:

☐ Setting Up Audio Card Drivers
☐ Installing Your Audio Card's Applications
☐ Testing the Installation
☐ Uninstalling your Audio Card Software

Before you start, make sure that you have installed Windows 95 on your system. If you don't have Windows 95 running before performing this installation, you will not be able to successfully complete the installation process outlined in this chapter.

Setting Up Audio Card Drivers

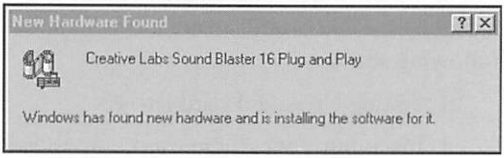
Jump to the next section, "Installing Your Audio Card's Applications," if you have just installed the CD-ROM drive that was packaged with your audio card or if your audio card's drivers are already set up.

You need software drivers to control your audio card. Installing these drivers in Windows 95 is easy as the operating system detects the existence of various audio card components, and either automatically installs the drivers or prompts you for the drivers. To set up the drivers for your audio card, you need your Windows 95 installation diskettes or CD-ROM. Your audio card drivers are in them.

Some of the dialog boxes shown below may not appear if you have previously installed an audio card in your Windows 95 system.

To set up the drivers:

1. Switch your system on.
   The audio interface on your audio card is detected. A dialog box similar to the one in Figure 3-1 appears.

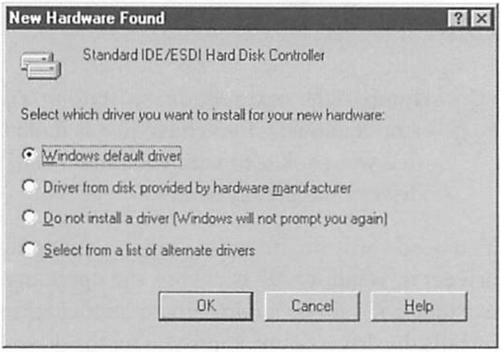


Creative Labs Sound Blaster 16 Plug and Play

Windows has found new hardware and is installing the software for it.

Figure 3-1: The New Hardware Found dialog box.

2. If you are prompted for a Windows 95 installation diskette or CD-ROM, insert the indicated diskette or CD-ROM in a drive.
3. If you inserted a Windows 95 diskette, specify the drive containing the diskette and choose OK.
4. The IDE CD-ROM interface on your audio card is detected. If the dialog box similar to that in Figure 3-2 appears, click the Windows default driver radio button and choose OK.



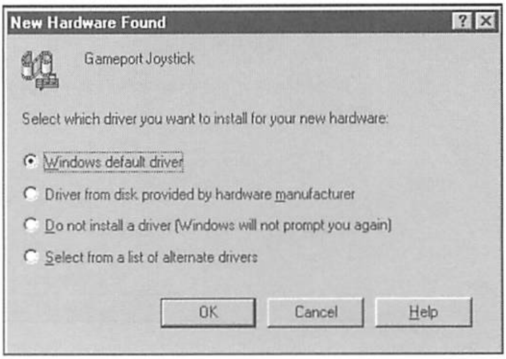
Standard IDE/ESDI Hard Disk Controller

Select which driver you want to install for your new hardware:

● Windows default driver
○ Driver from disk provided by hardware manufacturer
○ Do not install a driver (Windows will not prompt you again)
○ Select from a list of alternate drivers

Figure 3-2: The CD-ROM Drive Interface Found dialog box.

5. The joystick port on your audio card is detected. If the dialog box similar to that in Figure 3-3 appears, click the Windows default driver radio button and choose OK.



Gameport Joystick

Select which driver you want to install for your new hardware:

● Windows default driver

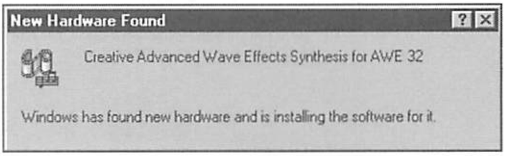
○ Driver from disk provided by hardware manufacturer

○ Do not install a driver (Windows will not prompt you again)

○ Select from a list of alternate drivers

Figure 3-3: The Joystick Found dialog box.

6. The wavetable synthesizer on your audio card is detected. A dialog box similar to that in Figure 3-4 appears.



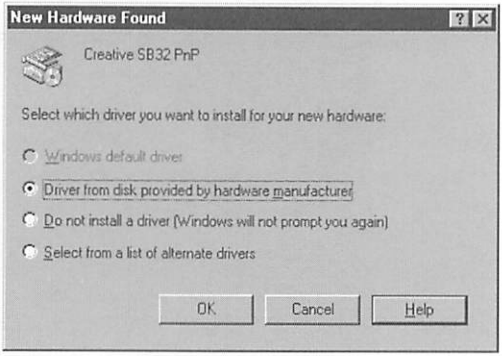
Creative Advanced Wave Effects Synthesis for AWE 32

Windows has found new hardware and is installing the software for it.

Figure 3-4: The Wavetable Synthesizer Found dialog box.

7. If you are prompted for a Windows 95 installation diskette, insert the indicated diskette in a drive and choose OK.

8. The 3D Stereo Enhancement device on your audio card is detected. A dialog box similar to that in Figure 3-5 appears.



New Hardware Found

Creative SB32 PnP

Select which driver you want to install for your new hardware:

○ Windows default driver

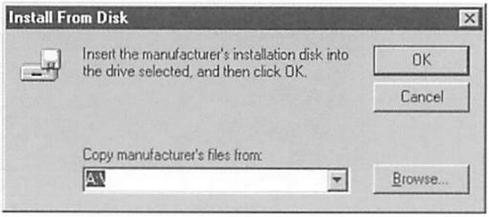
● Driver from disk provided by hardware manufacturer

○ Do not install a driver (Windows will not prompt you again)

○ Select from a list of alternate drivers

Figure 3-5: The 3D Stereo Enhancement Installation dialog box.

9. Click OK. A Install From Disk dialog box similar to that in Figure 3-6 appears.



Install From Disk

Insert the manufacturer's installation disk into the drive selected, and then click OK.

Copy manufacturer's files from: A:\

Figure 3-6: The Install From Disk dialog box.

10. Insert the Creative Drivers diskette into your floppy drive. Choose the appropriate drive and click OK. The required files are copied from the floppy drive to your hard disk.

The drivers for your audio card are now set up. Go on to the next section to install your card's applications.

Installing Your Audio Card's Applications

Your audio card applications can be installed from a CD-ROM or a diskette depending on whether an installation CD-ROM or an installation diskette is supplied in your package.

To install from CD-ROM:

1. Ensure that your CD-ROM drive is installed and working properly. If not, refer to your drive's documentation to troubleshoot it.
2. Load your audio card's software installation CD-ROM into your CD-ROM drive.
   The CD-ROM supports Windows 95 AutoPlay mode and starts running automatically. If it does not, refer to Appendix D, "Troubleshooting".
3. Follow the instructions on the screen to finish installing your audio card's applications.

To install the applications from diskette:

1. Insert the applications' installation diskette into the appropriate drive in your system.
2. Click Start in the task bar.
   The Start popup menu appears
3. Select Settings from the Start popup menu as shown in Figure 3-7.

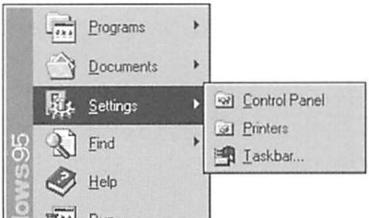
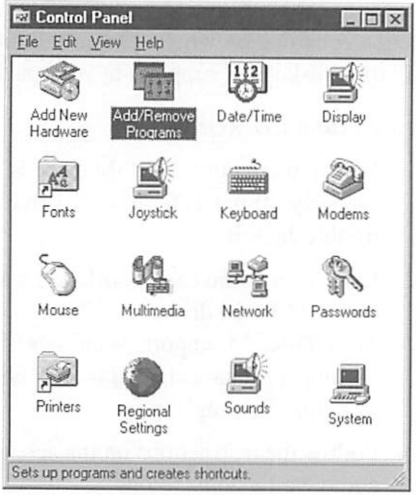


Figure 3-7: The Start popup menu.

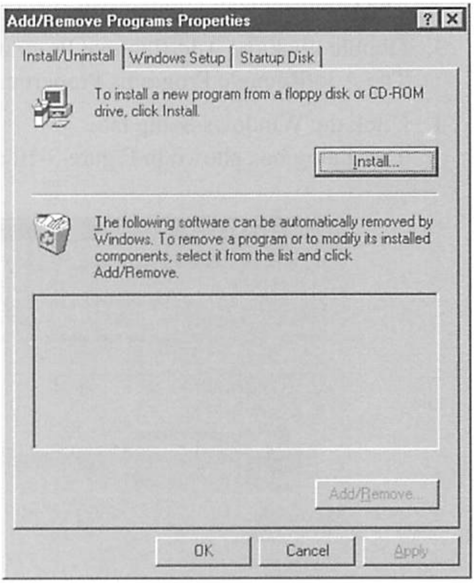
4. Select Control Panel from the Settings sub-menu.
   The Control Panel group box similar to Figure 3-8 appears.



Sets up programs and creates shortcuts.

Figure 3-8: The Control Panel group box.

5. Double-click the Add/Remove Programs icon.
   The Add/Remove Programs Properties dialog box similar to Figure 3-9 appears.



To install a new program from a floppy disk or CD-ROM drive, click Install.

The following software can be automatically removed by Windows. To remove a program or to modify its installed components, select it from the list and click Add/Remove.

Figure 3-9: The Add/Remove Programs Properties dialog box.

6. Choose Install.
7. Follow the instructions on the screen to finish the installation.

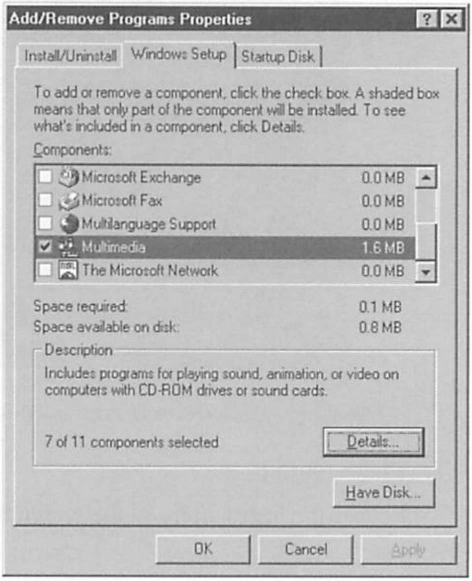
Testing the Installation

When the applications have been installed, you can test your audio card to find out if it is working properly.

The testing procedure requires the Windows 95 Media Player. Follow the Start button's menus, as depicted in Figure 3-12, to see if the Media Player icon is displayed. If it is not displayed, follow the instructions below to install the Media Player. If it is displayed, jump to the instructions on the next page to test the audio card.

To install the Media Player:

1. Click the Start button.
2. Select Settings and then Control Panel.
   The Control Panel group box is displayed.
3. Double-click the Add/Remove Programs icon.
   The Add/Remove Programs Properties dialog box appears.
4. Click the Windows Setup tab.
   The dialog box shown in Figure 3-10 appears.



To add or remove a component, click the check box. A shaded box means that only part of the component will be installed. To see what's included in a component, click Details.

Components:

☐	Microsoft Exchange	0.0 MB
☐	Microsoft Fax	0.0 MB
☐	Multilanguage Support	0.0 MB
☑	Multimedia	1.6 MB
☐	The Microsoft Network	0.0 MB

Space required: 0.1 MB

Space available on disk: 0.8 MB

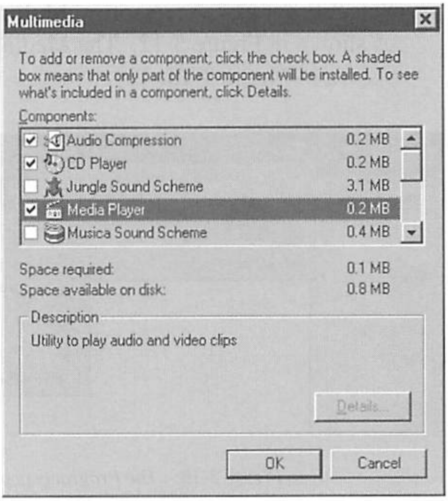
Description

Includes programs for playing sound, animation, or video on computers with CD-ROM drives or sound cards.

7 of 11 components selected

Figure 3-10: The Windows Setup, Add/Remove Programs Properties dialog box.

5. Select Multimedia and choose Details.
   The Multimedia dialog box shown in Figure 3-11 appears.



To add or remove a component, click the check box. A shaded box means that only part of the component will be installed. To see what's included in a component, click Details.

Components:

☑	Audio Compression	0.2 MB
☑	CD Player	0.2 MB
☐	Jungle Sound Scheme	3.1 MB
☑	Media Player	0.2 MB
☐	Musica Sound Scheme	0.4 MB

Space required: 0.1 MB

Space available on disk: 0.8 MB

Description: Utility to play audio and video clips

Figure 3-11: The Multimedia dialog box.

6. Click the Media Player check box and choose OK.
7. Follow the instructions on the Media Player installation.

The Media Player is now installed. Follow the instructions below to test your audio card.

To test the audio card:

1. Click Start in the task bar.
2. Select Programs, Accessories, Multimedia, and Media Player as shown in Figure 3-12. The Media Player appears and is shown in Figure 3-13.

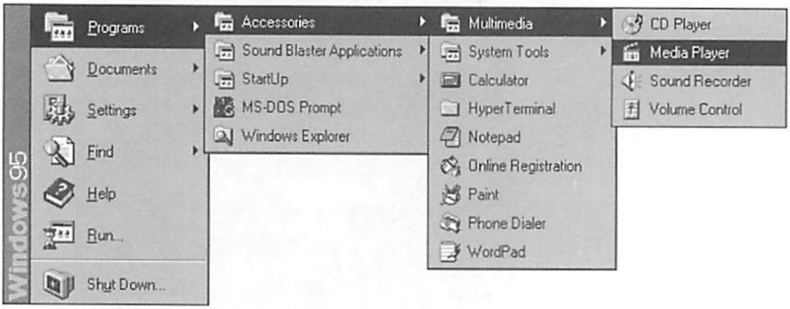


Figure 3-12: The Programs popup menu.

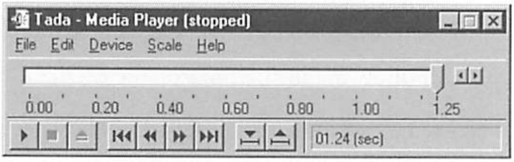
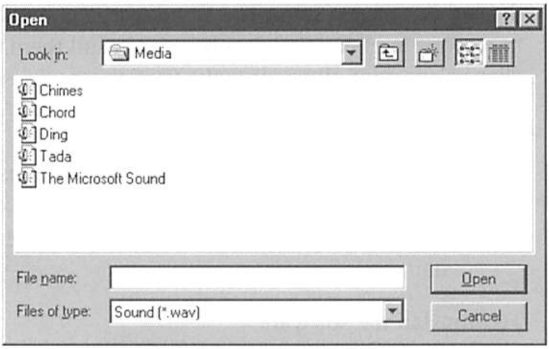


Figure 3-13: The Media Player interface.

3. In the File menu, select the Open command.
   The Open dialog box appears with a list of sounds (see Figure 3-14).



Look in: Media

Chimes
Chord
Ding
Tada
The Microsoft Sound

File name:
Files of type: Sound (*.wav)

Figure 3-14: The Open dialog box.

4. Select Tada from the list of sounds.
5. Choose Open.
6. Click ▶ on the Media Player.
   You should hear the Tada sound being played.

If there is no sound during the test, check the following:

☐ Speakers are connected to the card's audio output connector.

☐ Volume control knob of the speakers (if any) is set at mid-range.

☐ No hardware conflict between the audio card and another peripheral card.

⚠ The built in stereo power amplifier has a maximum output power of four watts per channel for eight ohm speakers. Do not play at maximum volume if your speakers cannot handle this power.

Uninstalling your Audio Card Software

Many applications share resources and make modifications throughout your system. The Windows 95 uninstall feature allows you to remove applications cleanly or re-install them to correct problems, change configurations, or make version upgrades. You can use the uninstall feature on your audio card's software.

Please quit all your audio card applications before carrying out the uninstall procedure. If a card's application is running during the uninstall procedure, that application will not be uninstalled.

To uninstall the software:

1. Click Start in the task bar.
2. Select Settings from the Start popup menu as shown in Figure 3-15.

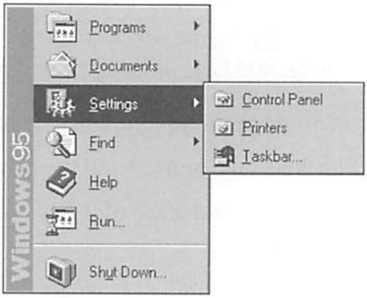
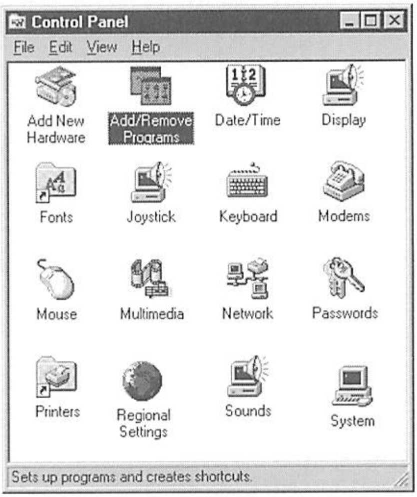


Figure 3-15: The Start popup menu.

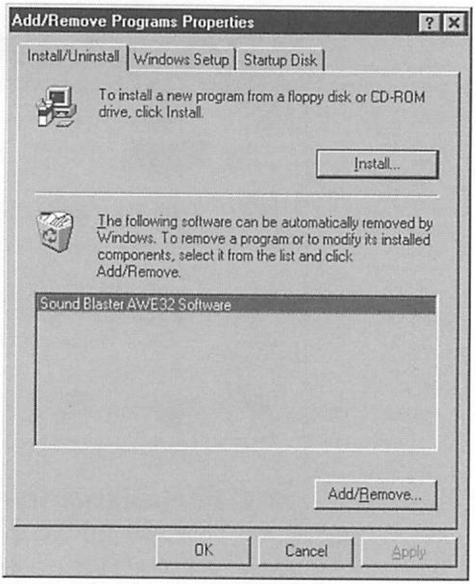
3. Select Control Panel from the Settings sub-menu as shown in Figure 3-15.
   The Control Panel group box like the one in Figure 3-16 appears.



Sets up programs and creates shortcuts.

Figure 3-16: The Control Panel group box.

4. Double-click the Add/Remove Programs icon.
   The Add/Remove Programs Properties dialog box similar to the one in Figure 3-17 appears.



To install a new program from a floppy disk or CD-ROM drive, click Install.

The following software can be automatically removed by Windows. To remove a program or to modify its installed components, select it from the list and click Add/Remove.

Sound Blaster AWE32 Software

Figure 3-17: The Add/Remove Programs Properties dialog box.

5. Select Sound Blaster AWE32 Software from the list and choose Remove.
   The files pertaining to your audio card applications are deleted.

6. Follow the instructions on screen to complete the uninstall process.

4

Installing Software in DOS/ Windows 3.1x

This chapter provides instructions to install your audio card's software in a DOS/Windows 3.1x system. It consists of the following sections:

- ☐ Installing From CD-ROM
- ☐ Installing From Diskettes
- ☐ Testing the Installation

Your package may come with an installation CD-ROM or an installation diskette to install your audio card's software. Please use the appropriate section based on the installation media provided in your package.

Installing From CD-ROM

Before you can install the audio card's software from the CD-ROM, a CD-ROM drive must be installed and working properly in your system.

If you have not yet installed a CD-ROM drive and associated drivers, refer to your CD-ROM drive's documentation for instructions. You can use the diskette provided with the CD-ROM to install the drivers needed by your CD-ROM drive.

To install the audio card's software from CD-ROM:

1. Quit to DOS if you are in Windows.

   The installation will not work if you install from the Windows DOS prompt.

2. Insert the installation CD-ROM into your CD-ROM drive.

3. At the DOS prompt, change to the drive containing your CD-ROM. For example, type **D:**.
4. Change to the WIN31 directory (e.g. type **CD WIN31**).
5. Type **INSTALL** and press <Enter>.
6. Follow the instructions presented on the screen to complete the installation.

When you have completed the installation and rebooted, proceed to the section "Testing Your Installation" in this chapter to find out if your installation works.

Installing From Diskettes

If a diskette is provided, to install the audio card's software:

1. Quit to DOS if you are in Windows.

   The installation will not work if you install from the Windows DOS prompt.

2. Insert your audio card's installation diskette into a drive.
3. At the DOS prompt, change to the drive containing your diskette. For example, if your diskette is in drive A, type **A:**.
4. Type **INSTALL** and press <Enter>.
5. Follow the instructions presented on the screen to complete the installation.

When you have completed the installation and rebooted, proceed to the section "Testing Your Installation" in this chapter to find out if your installation works.

Testing the Installation

Once you have installed the card, run the test program DIAGNOSE to make sure the card has been installed properly. This program checks the base I/O address, IRQ line, and DMA channels used by the audio interface. It then displays a menu to let you test the card's sound and music output.

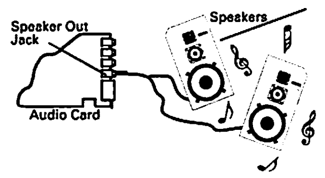


Figure 4-1

To run the test program:

1. At the DOS prompt, change to the directory containing your audio card's software (e.g. C:\SB16).
2. Type **DIAGNOSE** and press <Enter>.
3. Follow the instructions on the screen to complete the test.

If the test program stops or displays an error message when it is checking the audio interface's base I/O address, IRQ line, or DMA channels, it may be due to a conflict between the audio interface and another peripheral device. To resolve the conflict, you have to change the settings of your audio interface. (See the section "Changing Resource Settings in Windows 3.1x/DOS" in page 5-7 or Appendix D, "Troubleshooting" on how to change the settings and resolve the conflicts.)

If there is no sound output during the test, check the following:

- ☐ Speakers are connected to the card's audio output connector.
- ☐ Volume control knob of the speakers (if any) is set at mid-range.
- ☐ External amplifier or powered speakers is/are connected to the card's Line Out jack if you decide not to use the card's internal power amplifier.
- ☐ No hardware conflicts between the audio interface and another peripheral device.

The built-in stereo power amplifier has a maximum output power of four watts per channel for four ohm speakers and two watts per channel for eight ohm speakers. Do not play at maximum volume if your speakers cannot handle this power.

Understanding the Installation Program

The installation program creates a directory you specify, and copies the software provided in it. It then allows you to set up your Windows applications by adding a command to the WIN.INI file to run WINSETUP.EXE. This command automatically creates the audio card program group and the application icons when you next run Windows.

You can also choose to set up your Windows applications at a later time by running INSTALL from the audio card's directory in your hard disk. INSTALL also allows you to selectively set up components that were not installed previously.

The installation program also modifies your AUTOEXEC.BAT and CONFIG.SYS files. Details are provided in the following sections.

The AUTOEXEC.BAT File Settings

The installation program adds the following statements to the AUTOEXEC.BAT file.

```
SET BLASTER=A220 I5 D1 H5 P330 E620 T6
SET SOUND=C:\SB16
SET MIDI=SYNTH:1 MAP:E
C:\SB16\DIAGNOSE /S /W=C:\WINDOWS
C:\SB16\MIXERSET /P /Q
C:\SB16\AWEUTIL /S
```

The first 3 statements set up the environment variables for your audio card. The last 3 statements run the DIAGNOSE, MIXERSET, and AWEUTIL utilities.

The BLASTER statement is added by the DIAGNOSE utility, and the values shown above may differ from those in your system. Running DIAGNOSE with the /S parameter updates the BLASTER environment with the resource settings from the Plug and Play Configuration Manager. Running DIAGNOSE with the /W=C:\WINDOWS parameter updates the SYSTEM.INI file in the Windows directory with the resource settings from the Plug and Play Configuration Manager.

Refer to the section "Changing Resource Settings in Windows 3.1x/DOS" in page 5-7 for a description of the SOUND, BLASTER, and MIDI environment settings. For a description of the AWEUTIL utility, refer to your card's Windows 3.1/DOS User's Guide or the AWEUTIL.TXT file.

The CONFIG.SYS File Settings

The installation program also adds the following statements to the CONFIG.SYS file if you choose to install the low-level DOS device drivers under custom installation.

```
DEVICE= C:\SB16\DRV\CTSB16.SYS /UNIT=0
        /BLASTER=A:220 I:5 D:1 H:5
DEVICE= C:\SB16\DRV\CTMMSYS.SYS
```

The driver name CTSB16.SYS may be VIBRA16.SYS in your installation.

CTSB16.SYS (or VIBRA16.SYS) and CTMMSYS.SYS are low-level device drivers that provide wave playback and recording for DOS applications. These include third-party DOS applications developed with Creative Lab's Sound Blaster Developer Kit. These programs work with the drivers (such as CTWDSK.DRV, CTWMEM.DRV, CTVDSK.DRV, and CT-VOICE.DRV) that require the low-level drivers. The drivers are found in the DRV subdirectory of your audio card's directory.

If your system does not have enough memory when you are using Windows applications or playing DOS games, you can delete the above two statements from the CONFIG.SYS file using a text editor.

At a later time, you may discover that you need the low-level device drivers for your software application. You can load them into memory by typing DIAGNOSE /A at the DOS prompt and pressing <Enter>. This command adds the required statements to the CONFIG.SYS file.

Please also refer to the section "Optimizing Memory Usage" in page 4-6 of this chapter on how to optimize your memory after you have loaded the low-level drivers.

Optimizing Memory Usage

Before you embark on loading CTSB16.SYS (or VIBRA16.SYS) and CTMMSYS.SYS into memory, you should consider whether you actually need these drivers to run your software. If you do, we recommend that you load them into high memory (e.g. using memory managers) to maximize your memory usage.

If you don't need these drivers (e.g., if you are running Windows applications or playing DOS games only), you can bypass the loading of these drivers.

Using Memory Managers

You can use one of the following memory managers:

- ☐ If you use Microsoft DOS 6.x, run MEMMAKER to optimize the memory. (Please refer to the DOS 6.x documentation for instructions on how to use the MEMMAKER.)
- ☐ If you have a memory manager like QEMM or 386MAX, please refer to the respective software's documentation for instructions on how to optimize the memory by loading the drivers into the high memory area.

Bypassing the Loading of the Low-Level Drivers

You may bypass the loading of the low-level device drivers in one of the following ways:

☐ Using the DOS 6.x's multiple boot sessions. With this feature, several sessions can be made available for selection during bootup. One session can contain settings that loads the drivers into memory. When you do not wish to load these drivers into memory, you can select another session that allows you to boot up the system without these drivers. (Please refer to your DOS 6.x documentation for instructions on how to create the multiple boot sessions.)

☐ Using the Bypass Installation feature of the low-level device drivers. During system startup, simply press and hold down the <ALT> key after the RAM test.

5

Changing Your Audio Card Settings

This chapter shows you how to change the settings of the jumpers, resources and Creative 3D Stereo Enhancement effect of your audio card. It is organised as follows:

- ☐ A Closer Look at Your Hardware Settings
- ☐ Changing Jumper Settings
- ☐ Changing Resource Settings in Windows 3.1x/DOS
- ☐ Enabling/Disabling Creative 3D Stereo Enhancement Effect

A Closer Look at Your Hardware Settings

If you intend to change the hardware settings of your audio card, you should first become more familiar with the jumpers on the card shown in Figure 5-1.

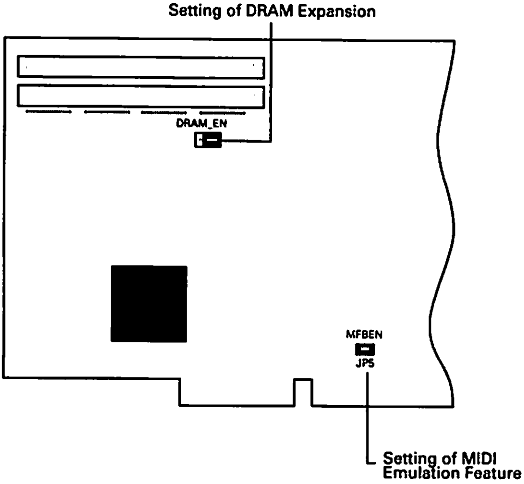


Figure 5-1: Jumpers on the audio card.

In this guide, the disabled and enabled jumpers are represented using blocks as shown in Figure 5-2.

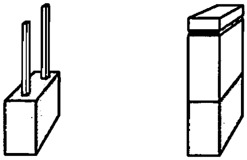


Figure 5-2: Representation of disabled (left) and enabled (right) jumpers.

Changing Jumper Settings

The way the jumpers on your audio card are configured defines the hardware settings of the audio card. Before you change a jumper configuration, however, you should identify the current and the proposed settings. Check out how you can do so and then proceed to change the jumper configuration.

To change the jumper settings:

1. If you have already installed your audio card, switch off your computer and all other peripheral devices, and remove the system's cover and card from your system.
2. Identify the jumpers to change.
   For more information on the identities of the jumpers, refer to Figure 5-1.
3. Remove the jumper blocks from the jumpers as shown in Figure 5-3.

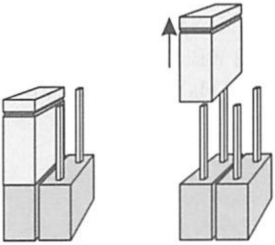


Figure 5-3: Removing the jumper block.

4. Select your desired jumper settings by placing the jumper blocks on the appropriate jumpers as shown in Figure 5-4.

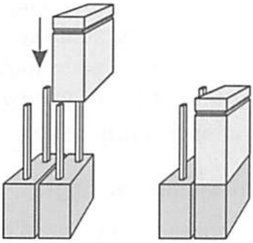


Figure 5-4: Inserting the jumper block.

Changing the DRAM Setting

If your audio card does not have a DRAM_EN jumper, please ignore all documentation on this jumper in this guide.

The jumper DRAM_EN configures your audio card to use the on-board 512 KB DRAM or the optional Single Inline Memory Modules (SIMMs). The factory default setting specifies use of the 512 KB DRAM.

To change the DRAM usage, enable the jumper corresponding to the setting shown in Figure 5-5.

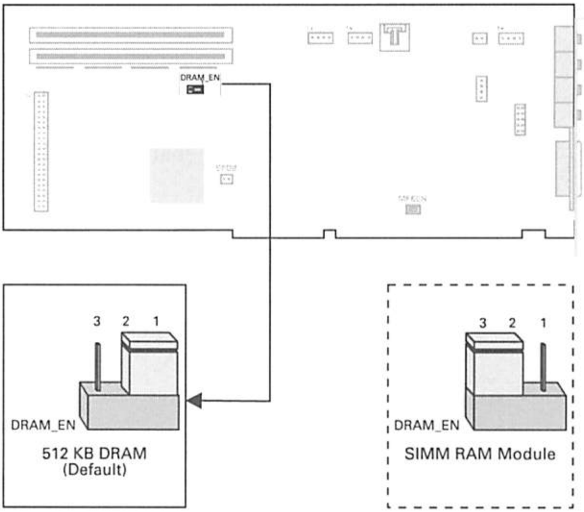


Figure 5-5: The available DRAM Expansion settings.

Enabling/Disabling MIDI Emulation

Read this section only if you are using your audio card in DOS.

The MIDI Emulation mechanism on your audio card can be enabled/disabled using jumper MFBEN. The factory default setting is enabled. To change the setting, enable or disable jumper MFBEN as shown in Figure 5-6.

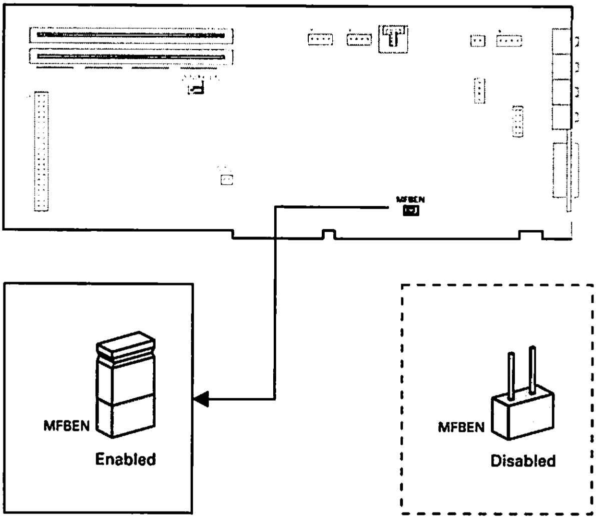


Figure 5-6: The available MIDI Emulation settings.

Changing Resource Settings in Windows 3.1x/DOS

When your audio card encounters a conflict with another peripheral device, you need to change the resource settings of your audio card. This can be done by running the ISA Configuration Utility that comes with your system's Plug and Play Configuration Manager. This utility shows you which resources are available for your audio card and allows you to choose them.

When you have changed the resource settings, you will be asked to reboot. During reboot, your system's environment will be updated with the new settings. You can view the system's environment by typing **SET** at the DOS prompt. The three environment variables that belong to your audio card are described below.

SOUND Environment Variable

The SOUND environment variable specifies the directory location of your audio card's drivers and software. The syntax for the SOUND environment variable is as follows:

```
SOUND=path
```

where *path* is the drive and directory of your audio card's software (e.g. C:\SB16).

There is no space before and after the equal sign.

BLASTER Environment Variable

The BLASTER environment variable specifies the base I/O address, IRQ line, and DMA channel of your audio interface. The syntax for the BLASTER environment variable is as follows:

```
BLASTER=A220 I5 D1 H5 P330 E620 T6
```

The values shown above may be different for your system. Also, there is no space before and after the equal sign, but there must be at least one space between two parameters.

The settings for the parameters in the command are described below.

Parameter	Description
A*xxx*	Specifies the audio interface's base I/O address. Default value of *xxx* is 220.
I*x*	Specifies the IRQ line used by the audio interface. Default value of *x* is 5.
D*x*	Specifies the Low DMA channel used by the audio interface. Default value of *x* is 1.
H*x*	Specifies the High DMA channel used by the audio interface. Default value of *x* is 5.
P*xxx*	Specifies the MPU-401 UART interface's base I/O address. Default value of *xxx* is 330.
E*xxx*	Specifies the Advanced WavEffects chip's base I/O address. Default value of *xxx* is 620.
T*x*	Specifies the card type. *x* must be 6.

MIDI Environment Variable

The MIDI environment variable specifies the MIDI file format used and where the MIDI data is sent to. The MIDI data can be sent to the internal stereo music synthesizer or MIDI port.

Generally, there are three MIDI file formats available in the market, General MIDI, Extended MIDI and Basic MIDI. The syntax for the MIDI environment variable is as follows:

```
MIDI=SYNTH:x  MAP:x  MODE:x
```

The parameters of the command are described below.

Parameter	Description
SYNTH:*x*	*x* can be 1 or 2. 1 (default setting) specifies the stereo music synthesizer. 2 specifies MIDI port.
MAP:*x*	*x* can be G, E, or B. G specifies General MIDI file format. E (default setting) specifies Extended MIDI file format. B specifies Basic MIDI file format.
MODE:*x*	*x* can be 0, 1, or 2. 0 (factory default) specifies General MIDI mode. 1 specifies General Standard mode. 2 specifies MT-32 mode.

Enabling/Disabling Creative 3D Stereo Enhancement Effect

The Creative 3D Stereo Enhancement effect can be enabled or disabled in DOS and Windows 95.

This effect allows you to eliminate speaker crosstalk which occurs when two speakers are placed close together. With this effect enabled, the mono and stereo sound produced by your speakers will have increased depth and breadth.

In DOS

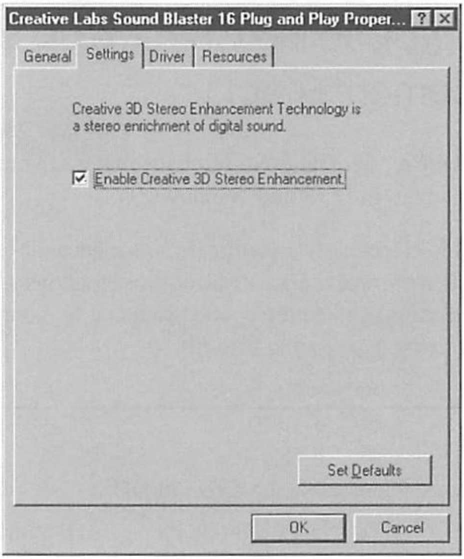
To enable/disable the effect in DOS:

1. At the DOS prompt, change to the directory containing your audio card's software.
2. Type **CT3DSE ON** to enable the effect or **CT3DSE OFF** to disable the effect.

In Windows 95

To enable/disable the effect in Windows 95:

1. Click Start in the task bar.
2. Select Settings and then Control Panel.
   The Control Panel group box appears.
3. Double-click the System icon.
   The System Properties dialog box appears.
4. Click the Device Manager tab.
   A list of devices in your system appears.
5. Double-click Sound, video and game controllers.
   Your audio card's name appears.
6. Select your audio card and choose Properties.
   Your audio card's properties dialog box appears.
7. Click the Effects tab.
   The dialog box shown in Figure 5-7 appears.



Creative 3D Stereo Enhancement Technology is a stereo enrichment of digital sound.

☑ Enable Creative 3D Stereo Enhancement

Figure 5-7: The Enable/Disable Creative 3D Stereo Enhancement dialog box.

8. Click on the Enable/Disable check box to enable/disable the Creative 3D Stereo Enhancement effect.
9. Choose OK.

A

General Specifications

This appendix lists the general specifications of your audio card.

Plug and Play

- ISA specification version 1.0a compliant

Advanced WavEffects 32 Music Synthesizer

- 32-voice polyphony
- 16 parts multi-timbral
- 1 MB ROM of General MIDI sample
- 512 KB built-in DRAM

If your audio card does not have a DRAM_EN jumper, it does not have 512KB DRAM built-in.

Stereo Music Synthesizer

- 4-operator 11-voice or 2-operator 20-voice stereo music synthesizer
- Compatible with previous Sound Blaster and Adlib music synthesizer chips

Stereo Digitized Voice Channel

- 16-bit and 8-bit digitizing in stereo and mono modes
- Programmable sampling rate, 5 kHz to 44.1 kHz in linear steps
- High and Low DMA channels using a single interrupt
- Dynamic filtering for digital audio recording and playback

Built in Digital/Analog Mixer

- Mixes sources from Digitized voice and inputs from MIDI devices, CD Audio, Line In, Microphone, and PC Speaker
- Selectable input source or mixing of various audio sources for recording

Volume Control

- Software volume control of Master Volume, Digitized voice and inputs from MIDI device, CD-audio, Line-in, Microphone, and PC Speaker
- PC Speaker at 4 levels in 6 dB steps
- All other sources at 32 levels in 2 dB steps
- Treble/Bass control at 15 levels from -14 dB to 14 dB in 2 dB steps
- Full software control of fade-in, fade-out, and panning

Built-in Stereo Power Amplifier

- Four watts per channel with four ohms stereo output
- Automatic Gain Control Amplifier/Fixed Gain Amplifier for Microphone Level
- Internal or External Audio Output Amplifier

Your audio card may or may not have a built-in amplifier.

MIDI Interface

☐ Built-in MIDI interface for connection to external MIDI devices

CD-ROM Interface

☐ Built-in CD-ROM interface for IDE CD-ROM drive

Your audio card may or may not have a CD-ROM interface.

Upgrade Options

☐ SIMM RAM modules for more sound samples

B

Hardware Information

You may want to connect your audio card to other devices inside your system — for example, to a Creative CD-ROM drive or another audio card. Or, you may want to redirect the "beeps" that you hear from your system to your external speakers.

This appendix helps you to do so by providing the following information:

- ☐ AUX1 Connector Pin Assignments
- ☐ AUX2 Connector Pin Assignments
- ☐ CD Audio Connector Pin Assignments
- ☐ IDE Connector Pin Assignments
- ☐ Modem Connector Pin Assignments
- ☐ PC Speaker Connector Pin Assignments
- ☐ SPDIF Connector Pin Assignments
- ☐ Telephone Answering Device Pin Assignments
- ☐ Redirecting PC Sounds to External Speakers

Read this section only if you are an advanced user who knows how to use the pin assignments. If you want to redirect sound, you should also be familiar with your system's motherboard and know where to find your system's internal speaker.

To locate the connectors on your audio card, see Figure 1-2. Note, however, that your card may not have all the connectors listed here. If it is so, please skip the relevant sections.

AUX1 Connector Pin Assignments

The PC Speaker connector has the following pin assignments as shown in Table B-1.

Table B-1: AUX1 Connector Pin Assignments.

Pin	Signal	I/O
1	AUX1 Left Channel	IN
2	Ground	IN
3	Ground	IN
4	AUX1 Right Channel	IN

AUX2 Connector Pin Assignments

The AUX2 connector has the following pin assignments as shown in Table B-2.

Table B-2: AUX2 Connector Pin Assignments.

Pin	Signal	I/O
1	AUX2 Left Channel	IN
2	Ground	IN
3	Ground	IN
4	AUX2 Right Channel	IN

CD Audio Connector Pin Assignments

Your audio card has two CD Audio Connectors.

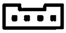
The CD Audio Connector  has the following pin assignments as shown in Table B-3.

Table B-3: CD Audio Connector Pin Assignments.

Pin	Signal	I/O
1	Ground	IN
2	CD Left Channel	IN
3	Ground	IN
4	CD Right Channel	IN

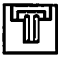
The CD Audio Connector  has the following pin assignments as shown in Table B-4.

Table B-4: CD Audio Connector Pin Assignments.

Pin	Signal	I/O
1	CD Left Channel	IN
2	Ground	IN
3	Ground	IN
4	CD Right Channel	IN

IDE Connector Pin Assignments

The IDE connector has the following pin assignments shown in Table B-5.

Table B-5: IDE Connector Pin Assignments.

Pin	Description	Pin	Description
1	Reset	2	Ground
3	DD7	4	DD8
5	DD6	6	DD9
7	DD5	8	DD10
9	DD4	10	DD11
11	DD3	12	DD12
13	DD2	14	DD13
15	DD1	16	DD14
17	DD0	18	DD15
19	Ground	20	NC
21	NC	22	Ground
23	DIOW	24	Ground
25	DIOR	26	Ground
27	IOCHRDY	28	BALEB
29	NC	30	Ground
31	IRQ	32	IOCS16_
33	DA1	34	NC
35	DA0	36	DA2
37	CS0	38	CS1
39	NC	40	Ground

Modem Connector Pin Assignments

The Modem connector has the following pin assignments shown in Table B-6.

Table B-6: Modem Connector Pin Assignments.

Pin	Description	I/O
1	Analog Ground.	In/Out
2	Pin is cut to provide keyed connection.	N/A
3	Mono line level input from modem to Line-In Jack.	In
4	Analog Ground.	In/Out
5	Left channel audio output to modem.	Out
6	Analog Ground.	In/Out
7	Right channel audio output to modem.	Out
8	Mono line level input from modem to PC Speaker.	In
9	Analog Ground.	In/Out
10	Microphone input from modem.	In

PC Speaker Connector Pin Assignments

The PC Speaker connector has the following pin assignments as shown in Table B-7.

Table B-7: PC Speaker Connector Pin Assignments.

Pin	Signal	I/O
1	+5V	In
2	PC Speaker Out	In

SPDIF Connector Pin Assignments

The SPDIF connector has the following pin assignments as shown in Figure B-8.

Table B-8: SPDIF Connector Pin Assignments.

Pin	Signal
0	Digital Out
1	Digital Ground

Telephone Answering Device Connector Pin Assignments

The Telephone Answering Device connector has the following pin assignments as shown in Table B-9.

Table B-9: Telephone Answering Device Connector Pin Assignments.

Pin	Description	I/O
1	Mono Line-In from modem.	In
2	Analog Ground	In/Out
3	Analog Ground	In/Out
4	Mic-Out: Microphone output to modem.	Out

Redirecting PC Sounds to External Speakers

It is possible to redirect the sounds that normally come from your computer's speaker to the speakers connected to the audio card.

⚠ If you do not know how to perform this process, seek the help of an experienced technician.

To redirect PC sounds to external speakers:

1. Locate the PC Speaker connection on the motherboard.
2. Remove the speaker connection from the motherboard.
3. From the motherboard, connect a wire from the +5V DC pin on the speaker connector to pin 1 of the PC Speaker connector on the audio card.
4. Connect another wire from the PC Speaker Out pin on the motherboard speaker to pin 2 of the PC Speaker connector on the card.

C

MIDI Specifications

This appendix is organized as follows:

- ☐ MIDI Implementation Chart
- ☐ GS Drum Preset Maps
- ☐ Preset Organization

MIDI Implementation Chart

This section lists your audio card's MIDI implementation chart. If you are not familiar with how to use the chart, read the following section on "Using MIDI Implementation Chart".

Table C-1: MIDI Implementation Chart.

Function	Transmitted	Received	Remarks
MIDI Channel	X	1 - 16 1 - 16	
Mode	X	3	
Note Number	X	0 - 127	
Velocity		9n, V = 0 - 127	
Note On	X	8n, V = 0 - 127	
Note Off	X		
Key Aftertouch	X	X	
Channel Aftertouch	X	O	
Pitch Bend *1	X	O	+/-2 Octave PitchBend Sensitivity recognized
Control Change *1			
0, 32	X	O	Bank select
1	X	O	Modulation
6, 38	X	O	Data entry
7	X	O	Main Volume
10	X	O	Pan
11	X	O	Expression
64	X	O	Damper Pedal
91	X	O	Reverb Depth
93	X	O	Chorus Depth
98	X	O	NRPN LSB
99	X	O	NRPN MSB
100	X	O	RPN LSB
101	X	O	RPN MSB
120	X	O	All Sounds Off
121	X	O	Reset All Controllers
123	X	O	All Notes Off
Program Change	X	O 0 - 127	

Notes:

*1 : All channels repond to MIDI volume (including drums)
Default power up : Bend = 2 semitones, master volume = 100, Controllers normal.

Mode 1: OMNI ON, POLY Mode 3: OMNI OFF, POLY O: Yes
Mode 2: OMNI ON, MONO Mode 4: OMNI OFF, MONO X: No

Using MIDI Implementation Chart

A "MIDI Implementation Chart" is included with every MIDI device.

To check feature compatibility between two MIDI devices:

1. Fold the MIDI implementation sheets vertically along the line between the Transmitted and Received columns.
2. Put the Transmitted column of the device you will use to send MIDI messages next to the Received column of the receiving devices.
3. Compare the sending and receiving features to see whether features are compatible between the devices. See Figure C-1.

If the feature is followed by matching Os, then the devices can use that feature together by means of MIDI. If either feature is marked with an X, then the two devices cannot be used together. Features that show ranges of numbers can be used together only in the values that overlap within two ranges.

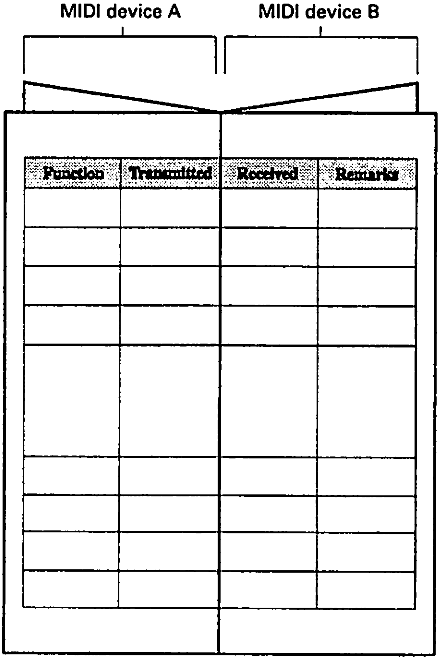


Figure C-1: Comparing your MIDI implementation charts.

GS Drum Preset Maps

You need to insert the SIMM RAM to have GS and MT-32 support. Otherwise, please skip this section.

The following tables list the drum preset maps used by your audio card. If you are not familiar with how to use the maps, read the following section on "Using GS Drum Preset Maps".

Table C-2: GS Drum Preset Maps.

	Prog# / Note Number	1:STANDARD Set 33:JAZZ Set	9:ROOM Set	17:POWER Set	25:ELECTRONIC Set
	27	High Q			
	28	Slap			
	29	Scratch Push			
	30	Scratch Pull			
	31	Sticks			
	32	Square Click			
	33	Metronome Click			
	34	Metronome Bell			
	35	Kick Drum 2			
C2	36	Kick Drum 1		MONDO Kick	Elec BD
	37	Side Stick			
	38	Snare Drum 1		Gated SD	Elec SD
	39	Hand Clap			
	40	Snare Drum 2			Gated SD
	41	Low Tom 2	Room Low Tom 2	Room Low Tom 2	Elec Low Tom 2
	42	Closed Hi - hat			
	43	Low Tom 1	Room Low Tom 1	Room Low Tom 1	Elec Low Tom 1
	44	Pedal Hi - hat			
	45	Mid Tom 2	Room Mid Tom 2	Room Mid Tom 2	Elec Mid Tom 2
	46	Open Hi - hat			
	47	Mid Tom 1	Room Mid Tom 1	Room Mid Tom 1	Elec Mid Tom 1
C3	48	High Tom 2	Room Hi Tom 2	Room Hi Tom 2	Elec Hi Tom 2
	49	Crash Cymbal 1			
	50	High Tom 1	Room Hi Tom 1	Room Hi Tom 1	Elec Hi Tom 1
	51	Ride Cymbal 1			
	52	Chinese Cymbal			Reverse Cymbal
	53	Ride Bell			
	54	Tambourine			
	55	Splash Cymbal			
	56	Cowbell			
	57	Crash Cymbal 2			
	58	Vibra - slap			
	59	Ride Cymbal 2			

Blank : Same as the percussion sound of "STANDARD"

Table C-3: GS Drum Preset Maps.

	Prog# / Note Number	1:STANDARD Set 33:JAZZ Set	9:ROOM Set	17:POWER Set	25:ELECTRONIC Set
C4	60	High Bongo			
	61	Low Bongo			
	62	Mute High Conga			
	63	Open High Conga			
	64	Low Conga			
	65	High Timbale			
	66	Low Timbale			
	67	High Agogo			
	68	Low Agogo			
	69	Cabasa			
	70	Maracas			
	71	Short Hi Whistle			
C5	72	Long Low Whistle			
	73	Short Guiro			
	74	Long Guiro			
	75	Claves			
	76	High Wood Block			
	77	Low Wood Block			
	78	Muted Cuica			
	79	Open Cuica			
	80	Mute Triangle			
	81	Open Triangle			
	82	Shaker			
	83	Jingle Bell			
C6	84	Belltree			
	85	Castanets			
	86	Mute Surdo			
	87	Open Surdo			
	88				

Blank : Same as the percussion sound of "STANDARD"

Table C-4: GS Drum Preset Maps.

	Prog# / Note Number	26:TR-808 Set	41:BRUSH Set	49:ORCHESTRA Set
	27			Closed Hi-Hat
	28			Pedal Hi-Hat
	29			Open Hi-Hat
	30			Ride Cymbal
	31			
	32			
	33			
	34			
	35			Concert BD 2
C2	36	808 Bass Drum		Concert BD 1
	37	808 Rim Shot		
	38	808 Snare Drum	Brush Tap	Concert SD
	39		Brush Slap	Castanets
	40		Brush Swirl	Concert SD
	41	808 Low Tom 2		Timpani F
	42	808 CHH		Timpani F#
	43	808 Low Tom 1		Timpani G
	44	808 CHH		Timpani G#
	45	808 Mid Tom 2		Timpani A
	46	808 OHH		Timpani A#
	47	808 Mid Tom 1		Timpani B
C3	48	808 Hi Tom 2		Timpani c
	49	808 Cymbal		Timpani c#
	50	808 Hi Tom 1		Timpani d
	51			Timpani d#
	52			Timpani e
	53			Timpani f
	54			
	55			
	56			
	57			Concert Cymbal 2
	58			
	59			Concert Cymbal 1

Blank : Same as the percussion sound of "STANDARD"

Table C-5: GS Drum Preset Maps.

	Prog# / Note Number	26:TR-808 Set	41:BRUSH Set	49:ORCHESTRA Set
C4	60			
	61			
	62	808 High Conga		
	63	808 Mid Conga		
	64	808 Low Conga		
	65			
	66			
	67			
	68			
	69			
	70	808 Maracas		
	71			
C5	72			
	73			
	74			
	75	808 Claves		
	76			
	77			
	78			
	79			
	80			
	81			
	82			
	83			
C6	84			
	85			
	86			
	87			
	88			Applause

Blank : Same as the percussion sound of "STANDARD"

Table C-6: GS Drum Preset Maps.

	Note Number	Prog#	57:SFX Set
		39	High Q
	40		Slap
	41		Scratch Push
		42	Scratch Pull
	43		Sticks
		44	Square Click
	45		Metronome Click
		46	Metronome Bell
	47		Guitar sliding finger
C3	48		Guitar cutting noise (down)
		49	Guitar cutting noise (up)
	50		String slap of double bass
		51	Fl. Key Click
	52		Laughing
	53		Screaming
		54	Punch
	55		Heart Beat
		56	Footsteps1
	57		Footsteps2
		58	Applause
	59		Door Creaking
C4	60		Door
		61	Scratch
	62		Windchime
		63	Car-Engine
	64		Car-Stop
	65		Car-Pass
		66	Car-Crash
	67		Siren
		68	Train
	69		Jetplane
		70	Helicopter
	71		Starship
C5	72		Gun Shot
		73	Machine Gun
	74		Lasergun
		75	Explosion
	76		Dog
	77		Horse-Gallop
		78	Birds
	79		Rain
		80	Thunder
	81		Wind
		82	Seashore
	83		Stream
C6	84		Bubble

Table C-7: GS Drum Preset Maps.

	Prog# Note Number	128:CM-64/32L Set
	34	
	35	Acoustic Bass Drum
C2	36	Acoustic Bass Drum
	37	Rim Shot
	38	Acoustic Snare Drum
	39	Hand Clap
	40	Electronic Snare Drum
	41	Acoustic Low Tom
	42	Closed High Hat
	43	Acoustic Low Tom
	44	Open High Hat 2
	45	Acoustic Middle Tom
	46	Open High Hat 1
	47	Acoustic Middle Tom
C3	48	Acoustic High Tom
	49	Crash Cymbal
	50	Acoustic High Tom
	51	Ride Cymbal
	52	- - -
	53	- - -
	54	Tambourine
	55	
	56	Cowbell
	57	- - -
	58	- - -
	59	- - -
C4	60	High Bongo
	61	Low Bongo
	62	Mute High Conga
	63	High Conga
	64	Low Conga
	65	High Timbale
	66	Low Timbale
	67	High Agogo
	68	Low Agogo
	69	Cabasa
	70	Maracas
	71	Short Whistle

	Prog# Note Number	128:CM-64/32L Set
C5	72	Long Whistle
	73	Quijada
	74	- - -
	75	Claves
	76	Laughing
	77	Screaming
	78	Punch
	79	Heartbeat
	80	Footsteps 1
	81	Footsteps 2
	82	Applause
	83	Creaking
C6	84	Door
	85	Scratch
	86	Windchime
	87	Engine
	88	Car-Stop
	89	Car-Pass
	90	Crash
	91	Siren
	92	Train
	93	Jet
	94	Helicopter
	95	Starship
C7	96	Pistol
	97	Machine Gun
	98	Lasergun
	99	Explosion
	100	Dog
	101	Horse-Gallop
	102	Birds
	103	Rain
	104	Thunder
	105	Wind
	106	Waves
	107	Stream
C8	108	Bubble

- - - = No Sound

Using GS Drum Preset Maps

This section helps you to understand what is a drum kit and how to use the GS drum preset maps.

In the GS synthesizer mode, you can select any drum kit out of a selection of 10 drum kits (which includes the Standard Drum Kit) to play through MIDI channel 10. The choice of more drum kits offers you the flexibility to listen to songs with a wider variety of percussive instruments. These drum kits are shown in Table C-8.

Each drum kit is essentially an instrument that you can select in the same way you select a melodic instrument. For example, to select the TR-808 drum kit, all you need to do is change the program in MIDI channel 10 to 26. All percussion sounds will then be played back through the TR-808 drum kit.

Table C-8: Drum kits for GS synthesizer mode.

Name	Prog#	Description
Standard/Jazz	1/33	Standard General MIDI drum kit. Jazz is similar to the Standard drum kit.
Room	9	Similar to that of the Standard kit except that it has more room ambiance.
Power	17	Similar to that of the Standard kit, but with more powerful kick and snare drums.
Electronic	25	Electronic drum kit. Most of the percussion instruments in this drum kit are reminiscence of old analogue and digital rhythm machines (e.g., the Roland TR-707 and TR-909 rhythm machines).
TR-808	26	Electronic drum kit, reminiscence of the Roland TR-808 rhythm machine.
Brush	41	Similar to the Standard kit except that brushes have been added. This kit is mostly used for Jazz MIDI pieces.
Orchestra	49	An immense collection of concert drums and timpani.
SFX	57	A collection of sound effects.
CM-64/32L	128	Same as the MT-32 drum kit. This drum kit contains standard percussion at the lower range of the keyboard, and sound effects at the higher range of the keyboard.

Preset Organization

This section lists the various preset organizations of your audio card.

GM & GS Preset (Capitol tones)

This section lists the Capitol tones for GM & GS preset.

Table C-9: GM & GS Preset (Capitol tones).

	Prog#	Instrument	Prog#	Instrument
Piano	1	Piano 1	2	Piano 2
	3	Piano 3	4	Honky-tonk
	5	E. Piano 1	6	E. Piano 2
	7	Harpsichord	8	Clav.
Chromatic Percussion	9	Celesta	10	Glockenspiel
	11	Music Box	12	Vibraphone
	13	Marima	14	Xylophone
	15	Tubular-bell	16	Santur
Organ	17	Organ 1	18	Organ 2
	19	Organ 3	20	Church Org. 1
	21	Reed Organ	22	Accordion Fr
	23	Harmonica	24	Bandneon
Guitar	25	Nylon-str. Gt	26	Steel-str. Gt
	27	Jazz Gt.	28	Clean Gt.
	29	Muted Gt.	30	Overdrive Gt.
	31	Distortion Gt.	32	Gt. Harmonics
Bass	33	Acoustic Bs.	34	Fingered Bs.
	35	Picked Bs.	36	Fretless Bs.
	37	Slap Bass 1	38	Slap Bass 2
	39	Synth Bass 1	40	Synth Bass 2

Table C-10: GM & GS Preset (Capitol tones).

	Prog#	Instrument	Prog#	Instrument
Strings / orchestra	41	Violin	42	Viola
	43	Cello	44	Contrabass
	45	Tremolo Str	46	PizzicatoStr
	47	Harp	48	Timpani
Ensemble	49	Strings	50	Slow Strings
	51	Syn. Strings1	52	Syn. Strings2
	53	Choir	54	Voice Oohs
	55	SynVox	56	OrchestaHit
Brass	57	Trumpet	58	Trombone
	59	Tuba	60	MutedTrumpet
	61	French Horn	62	Brass 1
	63	Synth Brass1	64	Synth Brass2
Reed	65	Soprano Sax	66	Alto Sax
	67	Tenor Sax	68	Baritone Sax
	69	Oboe	70	English Horn
	71	Bassoon	72	Clarinet
Pipe	73	Piccolo	74	Flute
	75	Recorder	76	Pan Flute
	77	Bottle Blow	78	Shakuhachi
	79	Whistle	80	Ocarina
Synth lead	81	Square Wave	82	Saw Wave
	83	Syn. Calliope	84	Chiffer Lead
	85	Charang	86	Solo Vox
	87	5th Saw Wave	88	Bass & Lead

Table C-11: GM & GS Preset (Capitol tones).

	Prog#	Instrument	Prog#	Instrument
Synth pad etc.	89	Fantasia	90	Warm Pad
	91	Polysynth	92	Space Voice
	93	Bowed Glass	94	Metal Pad
	95	Halo Pad	96	Sweeo Pad
Synth SFX	97	Ice Rain	98	Soundtrack
	99	Crystal	100	Atmosphere
	101	Brightness	102	Goblin
	103	Echo Drops	104	Star Theme
Ethnic	105	Sitar	106	Banjo
	107	Shamisen	108	Koto
	109	Kalima	110	Bag Pipe
	111	Fiddle	112	Shannai
Percussive	113	Tinkle Bell	114	Agogo
	115	Steel Drums	116	Woodblock
	117	Taiko	118	Melo Tom 1
	119	Synth Drum	120	ReverseCym.
SFX	121	Gt. FretNoise	122	Breath Noise
	123	Seashore	124	Bird
	125	Telephone 1	126	Helicopter
	127	Applause	128	Gun Shot

GS Preset (Variation Tones)

Table C-12 and Table C-13 list the variation tones for GS preset. If you are not familiar with how to use use the table, please read the following section on "Using GS Preset (Variation Tones)".

Table C-12: GS preset (Variation tones).

Prog#	Bank Number	Instrument	Prog#	Bank Number	Instrument
5	8	Detuned EP 1	32	8	Gt. Feedback
6	8	Detuned EP 2	39	8	Synth Bass 3
7	8	Coupled Hps.	40	8	Synth Bass 4
15	8	Church Bell	49	8	Orchestra
17	8	Detuned Or. 1	51	8	Syn. Strings3
18	8	Detuned Or. 2	62	8	Brass 2
20	8	Church Org. 2	63	8	Synth Brass3
22	8	Accordion It	64	8	Synth Brass4
25	8	Ukulele	81	8	Sine Wave
26	8	12-str. Gt	108	8	Taisho Koto
	16	Mandolin	116	8	Castanets
27	8	Hawaiian Gt.	117	8	Concert BD
28	8	Chorus Gt.	118	8	Melo. Tom 2
29	8	Funk Gt.	119	8	808 Tom
31	8	Feedback Gt.			

Table C-13: GS preset (Variation tones).

Prog#	Bank Number	Instrument	Prog#	Bank Number	Instrument
121	0	Gt. FretNoise	126	0	Helicopter
	1	Gt. Cut Noise		1	Car-Engine
	2	String Slap		2	Car-Stop
122	0	Breath Noise		3	Car-Pass
	1	Fl. Key Click		4	Car-Crash
123	0	Seashore		5	Siren
	1	Rain		6	Train
	2	Thunder		7	Jetplane
	3	Wind		8	Starship
	4	Stream		9	Burst Noise
	5	Bubble	127	0	Applause
124	0	Bird		1	Laughing
	1	Dog		2	Screaming
	2	Horse-Gallop		3	Punch
125	0	Telephone 1		4	Heart Beat
	1	Telephone 2		5	Footsteps
	2	DoorCreakin	128	0	Gun Shot
	3	Door		1	Machine Gun
	4	Scratch		2	Lasergun
	5	Windchime		3	Explosion

Using GS Preset (Variation Tones)

This section helps you understand what is a user bank and how it relates to the GS preset maps shown in Table C-12 on page C-15 and Table C-13 on page C-16.

Your audio card offers GS compatibility by including the user bank instruments found in GS. Instruments in a user bank are those that are similar in class or variation. For example, GM instrument number 25 is Nylon String Guitar (see Table C-9 on page C-12) and its variation is Ukulele (see Table C-12 on page C-15).

An instrument from a user bank (called variation instrument) is just like any GM instrument. Assume you are editing a MIDI file and one of the tracks is using Nylon String Guitar. Upon the playback of that track, you find that Nylon String Guitar does not produce the sound that you want. You can then choose to use Ukulele, the variation for Nylon String Guitar.

To do this, you need to insert a MIDI bank number of 8 (the bank number of Ukulele) into that track, followed by a program change of 25 to select "Ukulele" as the instrument.

The user bank instruments are available only in the "GS" mode of audio card. You can switch to "GS" mode via the Control Panel.

MT-32 Preset

The following tables list the MT-32 preset.

Table C-14: MT-32 Preset

Prog#	Instrument	Prog#	Instrument	Prog#	Instrument
1	Acou Piano 1	25	Syn Brass 1	49	Str Sect 1
2	Acou Piano 2	26	Syn Brass 2	50	Str Sect 2
3	Acou Piano 3	27	Syn Brass 3	51	Str Sect 3
4	Elec Piano 1	28	Syn Brass 4	52	Pizzicato
5	Elec Piano 2	29	Syn Bass 1	53	Violin 1
6	Elec Piano 3	30	Syn Bass 2	54	Violin 2
7	Elec Piano 4	31	Syn Bass 3	55	Cello 1
8	Honkytonk	32	Syn Bass 4	56	Cello 2
9	Elec Org 1	33	Fantasy	57	Contrabass
10	Elec Org 2	34	Harmo Pan	58	Harp 1
11	Elec Org 3	35	Chorale	59	Harp 2
12	Elec Org 4	36	Glasses	60	Guitar 1
13	Pipe Org 1	37	Soundtrack	61	Guitar 2
14	Pipe Org 2	38	Atmosphere	62	Elec Gtr 1
15	Pipe Org 3	39	Warm bell	63	Elec Gtr 2
16	Accordion	40	Funny Vox	64	Sitar
17	Harpsi 1	41	Echo Bell	65	Acou Bass 1
18	Harpsi 2	42	Ice Rain	66	Acou Bass 2
19	Harpsi 3	43	Oboe 2001	67	Elec Bass 1
20	Clavi 1	44	Echo Pan	68	Elec Bass 2
21	Clavi 2	45	Doctor Solo	69	Slap Bass 1
22	Clavi 3	46	School Daze	70	Slap Bass 2
23	Celesta 1	47	Bellsinger	71	Fretless 1
24	Celetra 2	48	Square Wave	72	Fretless 2

Table C-15: MT-32 Preset

Prog#	Instrument	Prog#	Instrument	Prog#	Instrument
73	Flute 1	92	Trombone 2	111	Bottleblow
74	Flute 2	93	Fr Horn 1	112	Breathpipe
75	Piccolo 1	94	Fr Horn 2	113	Timpani
76	Piccolo 2	95	Tuba	114	Melodic Tom
77	Recorder	96	Brs Sect 1	115	Deep Snare
78	Pan Pipes	97	Brs Sect 2	116	Elec Perc 1
79	Sax 1	98	Vibe 1	117	Elec Perc 2
80	Sax 2	99	Vibe 2	118	Taiko
81	Sax 3	100	Syn Mallet	119	Taiko Rim
82	Sax 4	101	Windbell	120	Cymbal
83	Clarinet 1	102	Glock	121	Castanets
84	Clarinet 2	103	Tube Bell	122	Triangle
85	Oboe	104	Xylophone	123	Orche Hit
86	Engl Horn	105	Marimba	124	Telephone
87	Bassoon	106	Koto	125	Bird Tweet
88	Harmonica	107	Sho	126	One Note Jam
89	Trumpet 1	108	Shakuhachi	127	Water Bell
90	Trumpet 2	109	Whistle 1	128	Jungle Tune
91	Trombone 1	110	Whistle 2		

If you set your audio card to the sound arrangement of MT-32, you will be able to play in the same manner as if you were playing the MT-32. However, since the sound module of MT-32 is organized differently from your audio card, you will not be able to perfectly duplicate the operations of the MT-32.

The delicate changes in the sound will appear different to those of the MT-32, when you change the sound of an instrument using such features as velocity, modulation, and aftertouch.

Your audio card cannot recognize MT-32 exclusive messages. Therefore, if MT-32 exclusive messages are received by your audio card, the settings of your audio card will not be changed.

D

Troubleshooting

This appendix provides some tips and strategies for some of the problems you might encounter with your audio card either during installation or normal use.

Problems Installing Audio Card Software from CD-ROM

The following are problems that you may encounter when installing your audio card's software from CD-ROM.

Problem	The CD-ROM does not automatically run after you insert it in the drive.
Cause	The AutoPlay notification setting in your Windows 95 system may not be enabled.

Solution

1. Enable the "Auto Insert Notification" check box. This check box can be found in your CD-ROM drive's properties page. To display this page:
    1. Click the Start button.
    2. Select Settings and then Control Panel.
    3. Double-click the System icon.
    4. Click the Device Manager tab and select your CD-ROM drive.
    5. Choose Properties.
       The properties page for your drive appears.

2. Alternatively, if you do not want to enable the "Auto Insert Notification" check box, perform the following steps:
    1. Double-click the My Computer icon on your Windows 95 desktop.
    2. Using your right mouse button, click the icon representing your CD-ROM drive.
       A pop-up menu appears.
    3. Select AutoPlay in the menu.
    4. Follow the instructions that appear.

Problems with Sound

The following are general problems you might encounter when trying to use sound.

Problem	No output from both the 8-bit and 16-bit digitized sounds when running the test program.
Causes	1. Volume knob on your speakers is not set properly. 2. Your speakers are connected to the wrong jack.
Solutions	1. Check that the volume knob or any other volume control found on the speaker is not set to zero. 2. Make sure the speakers are connected to the Speaker Out jack on your audio card.

Problems in DOS

The following are problems you might encounter in DOS.

Problem	SOUND or BLASTER environment could not be found
Cause	The command to set up the SOUND or BLASTER environment might not be included in the AUTOEXEC.BAT file. The SOUND environment specifies the directory location of your audio card's software while Blaster environment specifies the I/O address, IRQ line, and DMA channel settings of your audio interface. Both environment strings need to be set up in the DOS environment. When you install your audio card's software, the commands to set up the environments are automatically added to the AUTOEXEC.BAT file so that both environment strings are set up whenever your system is started or restarted. Whenever you make changes to the environment strings, it is advisable that the changes be reflected in the AUTOEXEC.BAT file.
Solution	To add the command to set up the BLASTER environment in the respective system files, run DIAGNOSE (see the section "Changing Resource Settings in Windows 3.1x/DOS" in page 5-7"The available MIDI Emulation settings." on page 6). To set up the SOUND environment, use a text editor to insert the statement SET SOUND=C:\SB16 into the AUTOEXEC.BAT file. Remember to reboot for the changes to take effect.
Problem	Error message "Out of environment space".
Cause	The system environment space is used up.
Solution	Add the statement SHELL=C:\COMMAND.COM /E:512 /P to the CONFIG.SYS file. /E defines a new size for the system environment space. You can choose a higher value if the environment size is already

512 bytes. (Normally, the next value is 1024 bytes.) For more information on the above statement, refer to your DOS manual.

Problem System hangs during 16-bit digitized sound test. But 8-bit works fine.

Cause Your system's mother board cannot handle High DMA at full speed. On some machines, the DMA controller on the motherboard does not function properly during High DMA transfers. High DMA transfers on such machines might corrupt the data in main memory and cause the system to hang or encounter a parity error.

Solution To solve this problem, run the ISA Configuration Utility and select to use Low DMA in place of the High DMA channel. 16-bit PCM data will then be transferred through the Low DMA channel.

Problems in Windows 3.1x

The following are problems you might encounter when in Windows 3.1x.

Problem No sound when running your audio card's Windows applications.

Cause One or more of the sound drivers might not be included in the SYSTEM.INI file.

Solution Check the SYSTEM.INI file by following the steps below:

1. Choose Run from the File menu in Program Manager.
2. Type **SYSEDIT** in the Command Line text box and choose OK.

3. Make sure the following statements are present:

```
[boot]
drivers=msmixmgr.dll

[drivers]
timer=timer.drv
midimapper=midimap.drv
Aux=sb16aux.drv
Wave=sb16snd.drv
MIDI=sbawe32.drv
MIDI1=sb16fm.drv
MIDI2=sb16snd.drv

[sndblst.drv]
Port=220
MIDIPort=330
Int=5
DmaChannel=1
HDmaChannel=5
```

The values shown in the [sndblst.drv] group may be different in your system

If one or more of the statements are missing, run INSTALL in DOS. INSTALL rewrites SYSTEM.INI to set up the drivers. It also sets up the Windows applications.

Resolving Conflicts

Conflicts occur when two or more peripheral devices contend for the same resources. Conflicts between your audio card and another peripheral device may occur if your card and the other device are set to use the same I/O addresses, IRQ line, or DMA channel.

Resolving Conflicts in Windows 95

To resolve conflicts in Windows 95, run Device Manager to change the resource settings of your audio card or the peripheral card in your system.

To run Device Manager:

1. Click Start on the task bar of your Windows 95 screen.
2. Select Settings from the Start popup menu.
3. Select Control Panel from the Settings popup menu.
4. Double-click the System icon within the Control Panel group box.
5. Click the Device Manager tab from the System Properties dialog box.
6. Select Sound, Video and Game Controllers.
7. Select your audio card's name and choose Properties.
8. In your audio card's Properties dialog box, click the Resources tab.
9. Click the Use automatic settings check box.
   If this check box is already enabled, you need to go into the Properties dialog box of the conflicting peripheral device and click the same check box there.
10. Reboot your system to allow Windows 95 to reassign resources to your audio card and/or the conflicting peripheral card.

You can see which peripheral device is conflicting with your audio card in the Device Status box in the General tab of your audio card's Properties dialog box.

Resolving Conflicts in DOS/Windows 3.1x

To resolve conflicts in DOS/Windows 3.1x:

1. Run the ISA Configuration Utility of your system's Plug and Play Configuration Manager. The peripheral devices that conflict with your audio card are noted.
2. Reselect the resource settings of your audio card that are in conflict.

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